

SWASH PLATE PUMP: DYNAMICS OF MECHANISM

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Abstract: Swash plate pumps unharnessed separate amounts of fluids into downstream piping. Every piston compartments creates a pressure rise and fall within the system piping, these pressure changes type a circular function waves. Owing to several benefits, swash plate pumps square measure wide unfold in hydraulic systems. The most benefits square measure the through drive capability, the adjustability and most of all, the high power density. Their application vary is proscribed, traditionally, to 450bar together with medium and better volume sizes. In higher pressure vary, constant pumps like unsteady disks or radial piston pumps square measure unremarkably used and will be as a result of the upper stressed components can be dimensioned abundant larger. Pumps with lower power like constant displacement gear pumps square measure typically utilized in low worth applications. within the gift study mechanism of the pump show that and see some dynamics of it's half.

Key Words: Swash plate, Piston, Pump, Motion.

1. INTRODUCTION:

A pump could be a device that moves fluids (liquids or gases), or typically slurries by mechanical action. Pumps operate by some mechanism (typically reciprocal or rotary), and consume energy to perform mechanical work by moving the fluid. Pumps operate via several energy sources, together with manual operation, electricity, engines, or alternative energy, are available several sizes, from microscopic to be used in medical applications to giant industrial pumps. Mechanical pumps serve in a very wide selection of applications like pumping water from wells, fish tank filtering, lake filtering and aeration, within the automotive trade for water-cooling and mechanical system, within the energy trade for pumping oil and gas or for operational cooling towers. Within the medical trade, pumps square measure used for organic chemistry processes in developing and producing medication, and as artificial replacements. Reciprocal pumps square measure used for prime pressure application.

2. WORKING PRINCIPLE OF THE PUMP:

A swash-plate axial piston pump is targeted on during this work, as shown in Figure one. Once a motor drives the spindle, the pistons rotate with the spindle and meantime perform reciprocator motion within the cylinder. Once a piston rotates from TDC (top dead center) to BDC (bottom dead center), it moves to the correct and delivers the oil out of the hard-hitting chamber. Then, the piston moves to left and sucks the oil into the unaggressive chamber whereas it rotates from BDC to TDC. Every chamber completes oil absorption and oil expulsion once a cycle. The displacement and dealing direction will be modified by rotating the angle management valve.

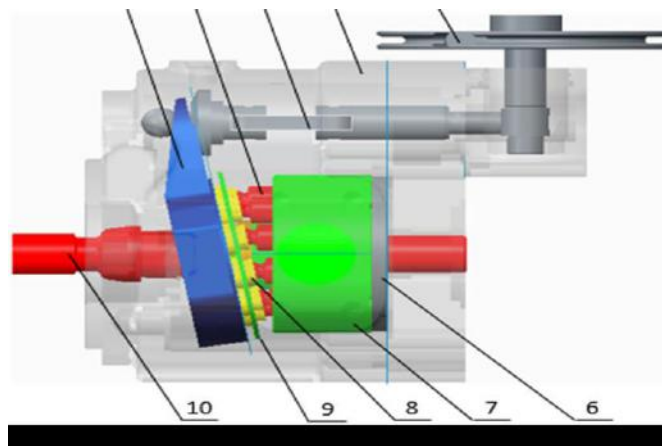


Figure 1. The swash- plate axial piston pump: (1) Swash plate; (2) Pistons; (3) Connecting rod; (4) Shell; (5) Variable displacement mechanism; (6) Valve plate; (7) Cylinder; (8) Slipper; (9) Slipper retainer; (10) Spindle

3. MOTION OF PISTON:

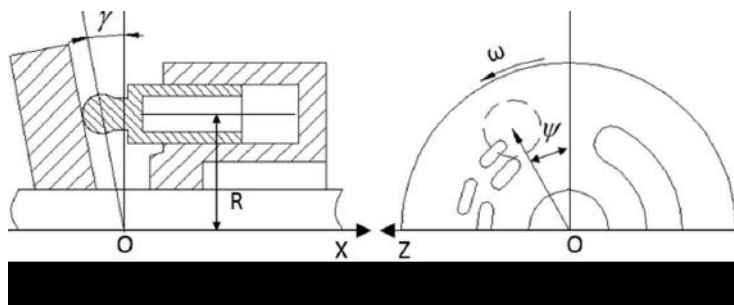


Figure 2. Piston motion

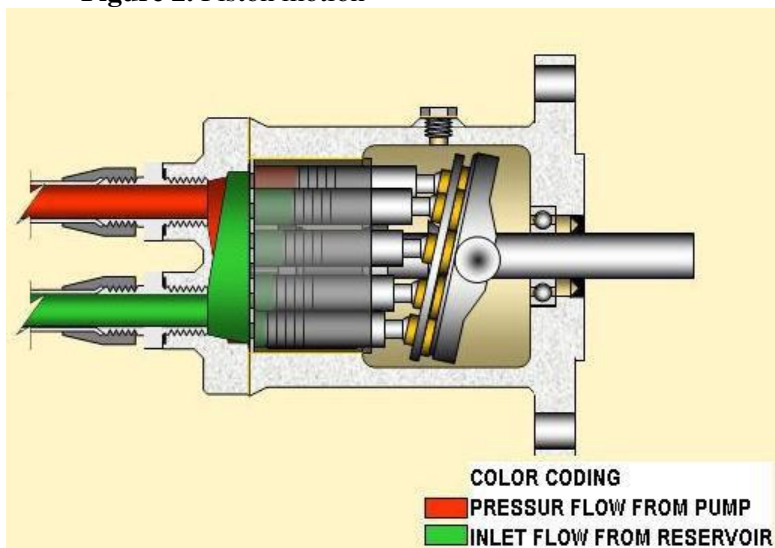
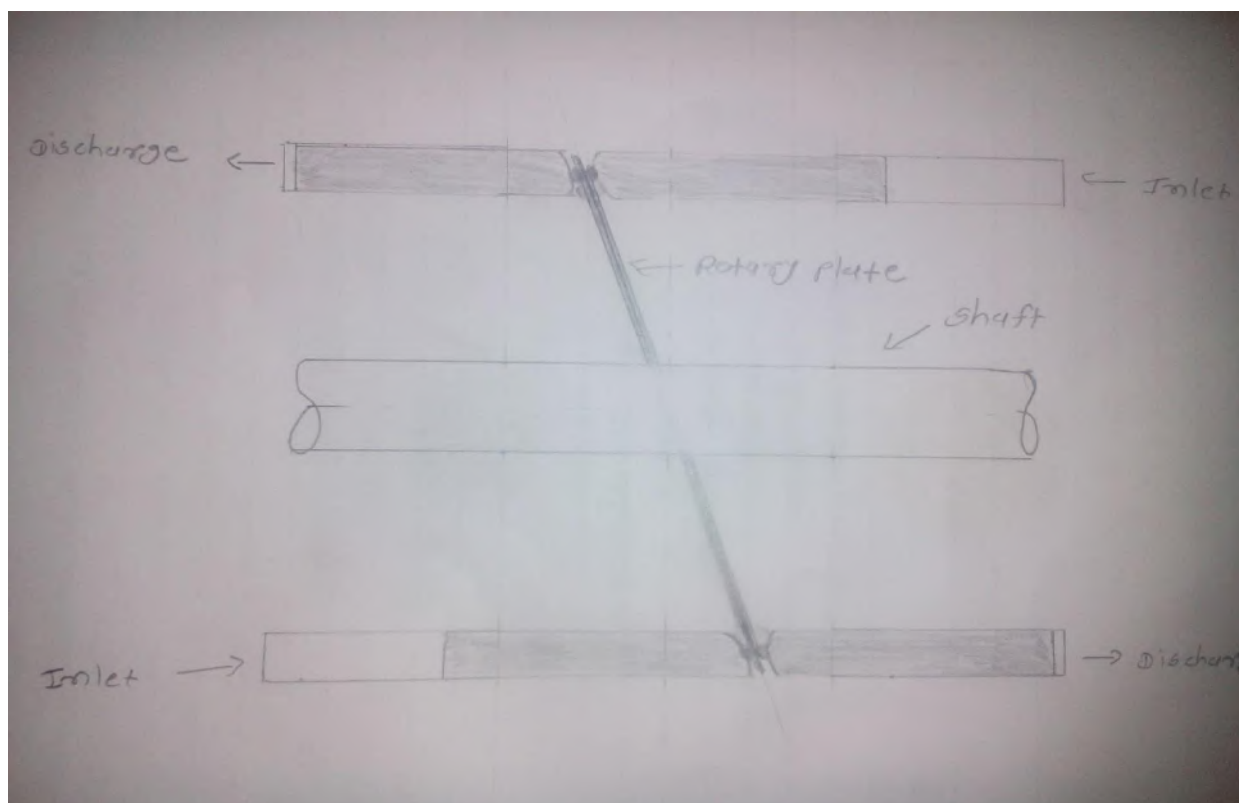


Figure 3. Model of Swash plate pump

4. DYNAMIC MODIFIED ON PUMP:



By this modified swash plate pump is working on multi direction. In this modified pump there are two side of the working of pump and this makes pump more discharge and high efficiency. When there is one side working of the piston is double with counting both side and as respectively increase discharge at pump outlet. As shown in figure of line diagram of pump and two side pump working overview is derived.

5. CONCLUSION:

By this pump there is scope in the system to modify with high pressure and discharge can be taken. Different technique is use to improve required parameters. By this paper conclude that change in pump mechanism can improve the entire system of pump.

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